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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/549,251

06/05/2006

Yuichiro Sasaki

38771

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52054 7590 01/21/2009

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EXAMINER

JOHNSTON, PHILLIP A

ART UNIT

PAPER NUMBER

2881

NOTIFICATION DATE

DELIVERY MODE

01/21/2009

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patdocket@pearne.com  
dchervenak@pearne.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/549,251	<b>Applicant(s)</b> SASAKI ET AL.	
	<b>Examiner</b> PHILLIP A. JOHNSTON	<b>Art Unit</b> 2881	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 June 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>9-2005, 2-2006, 8-2006</u> .                                  | 6) <input type="checkbox"/> Other: _____                          |

***Detailed Action***

1. This Office Action is submitted in response to the application filed 6-5-2006, wherein claims 1-19 are pending.

***Claims Rejection – 35 U.S.C. 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

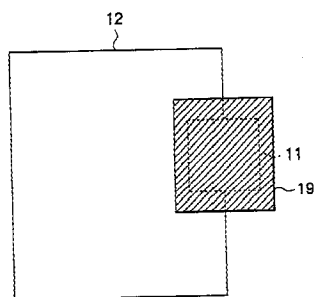
3. Claims 1-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,320,369 to Hidaka, in view of Ueda, USPN, 5,285,155.

4. Regarding claim 1, Hidaka teaches an ion beam current measurement device including the following;

(a) Detecting the magnetic field generated by the beam in detection loop 12 using superconducting sampling circuit 11 (a magnetic field sensor),

(b) Shielding sampling circuit 11 with superconducting ground plane 19 (a shielding part), as shown in Figure 10 below. See Col. 13, line 7-35,

**FIG. 10**



Hidaka discloses obtaining the conversion coefficient between the measurement target current  $I$  and the shielding current  $I_{cir}$  from the measurement employing DC current or the known measurement target current with low frequency at Col. 10, line 23-44, but fails to teach; the magnetic flux/feedback current conversion coefficient representing a ratio of a feedback current flowing to a feedback coil with respect to a change amount of magnetic flux passing through the magnetic field sensor.

Ueda discloses at Col. 3, line 1-49, a magnetic flux measurement apparatus using a SQUID that has a magnetic flux-voltage conversion coefficient.

Ueda modifies Hidaka to measure the external magnetic flux by monitoring the feedback current supplied to the feedback coil.

The applicant discloses at [0083], that the magnetic flux/feedback current conversion coefficient is proportional to the beam current/voltage conversion coefficient.

One of ordinary skill in the art recognizes that since the applicant discloses a magnetic flux/feedback current conversion coefficient that is proportional to a beam current/voltage conversion coefficient, therefore the magnetic flux-voltage conversion coefficient of Ueda is equivalent to the claimed magnetic flux/feedback current conversion coefficient.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made that Hidaka would use the magnetic flux/feedback current conversion coefficient of Ueda, which is no more than the predictable use of prior art elements according to their established functions allowing Hidaka to make magnetic

flux measurements with a Squid at high speed and with high accuracy. Col. 3, line 1-49.

The combination of Hidaka and Ueda fails to teach; wherein said magnetic field sensor has a magnetic flux/ feedback current conversion coefficient of  $8 \times 10^{-15}$  Wb/A or above; however, it would have been obvious to one of ordinary skill in the art to use a magnetic flux/ feedback current conversion coefficient of  $8 \times 10^{-15}$  Wb/A or above, since it has been held that discovering an optimum value of a result effective variable involves only, routine skill in the art. One would have been motivated to use a magnetic flux/ feedback current conversion coefficient of  $8 \times 10^{-15}$  Wb/A or above, for the purpose of detecting magnetic flux with extremely high sensitivity.

5. Regarding claims 2 and 3, as described above regarding claim 1, the combination of Hidaka and Ueda teaches that the magnetic flux/ feedback current conversion coefficient is a result effective variable, which one of ordinary skill recognizes, would include the claimed values.

6. Regarding claims 4-6, the combination of Hidaka and Ueda discloses the claimed beam current measuring apparatus, as described above regarding claim 1, wherein Ueda also discloses that it is known that a SQUID is capable of detecting magnetic flux with extremely high sensitivity, which one of ordinary skill in the art would interpret as no more than the predictable use of prior art elements according to their established functions.

7. Regarding claims 7 and 8, the combination of Hidaka and Ueda discloses the claimed beam current measuring apparatus, as described above regarding claim 1,

wherein Hidaka discloses the use of the claimed squid, and use of a high temperature superconductor. See Col. 4, line 58-60; and Col. 13, line 44-50.

8. Regarding claim 9, the combination of Hidaka and Ueda discloses the use of a ground plane to shield the sampling circuit as described above regarding claim 1.

10. Regarding claims 10 and 11, Hidaka teaches the use of both high temperature superconductors at Col. 13, line 44-48.

11. Regarding claim 12, the combination of Hidaka and Ueda discloses the use of a ground plane to shield the sampling circuit as described above regarding claim 1, which one of ordinary skill in the art would interpret from Figure 10 above as also including a space or gap in the assembly of the shield in order to reduce magnetic coupling or interference with the sampling circuit.

12. Regarding claim 13, Hidaka also discloses removing the resistance component in magnetic sensor 55 to reduce the influence of an electric field; i.e. (shielding). Col. 12, line 4-8.

13. Regarding claims 14 and 15, discloses the use of a coil wrapped around a soft magnetic material for collecting a generated magnetic field. Col. 14, line 34-45.

14. Claims 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,320,369 to Hidaka, in view of Ueda, USPN, 5,285,155, and in further view of Sferlazzo, USPN 5,133,074.

15. Regarding claims 16-18, the combination of Hidaka and Ueda discloses the apparatus used in these method claims as described above regarding claim 1, but fails

to teach the use of a magnetic sensor for measuring an ion beam current in an ion implantation apparatus.

15. Sferlazzo teaches the use of an ion beam sensor 110 for monitoring the beam in an ion implantation apparatus. Col. 5, line 28-67.

16. Sferlazzo modifies the combination of Hidaka and Ueda to provide or providing an ion beam line(note Figure 1), which treats one or more semiconductors wafers positioned at an ion implantation station.

17. Therefore, it would have been obvious to one of ordinary skill that the combination of Hidaka and Ueda would measure beam current in the ion implantation apparatus of Sferlazzo, which one of ordinary skill in the art would interpret as no more than the predictable use of prior art elements according to their established functions.

18. Regarding claim 19, the combination of Hidaka and Ueda discloses treating one or more semiconductors wafers positioned at an ion implantation station, as described above regarding claims 1, and 16-18.

### ***Conclusion***

19. Any inquiry concerning this communication or earlier communications should be directed to Phillip Johnston whose telephone number is (571) 272-2475. The examiner can normally be reached on Monday-Friday from 7:00 am to 4:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiners supervisor Robert Kim can be reached at (571)272-2293. The fax phone number for the organization where the application or proceeding is assigned is 571 273 8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PJ

January 5, 2008

/Phillip A Johnston/

Examiner, Art Unit 2881



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